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File: PGPB

Dec 27, 2001

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## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Suzuki, Satoru	Kanagawa		JP
Yui, Yasuji	Kanagawa		JP

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REPRESENTATIVE-FIGURES: 1

## ABSTRACT:

An apparatus of the invention comprises an operation inputting element for designating one of a plurality of functions; a function executing element for executing the function designated by the operating inputting element; a measuring element for measuring the time during which each of the functions has been executed by the function executing element; and a chargeable amount computing element for computing a chargeable amount based on the execution time measured by the measuring element regarding each of the functions.

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DOCUMENT-IDENTIFIER: US 20010056413 A1

TITLE: Electronic apparatus, charging system and method, charge processing device, storage medium and prepaid card

Summary of Invention Paragraph:

[0010] In on preferred structure according to the invention, the chargeable amount computing element may compute the chargeable amount based on the execution time for each of the functions and through weighting on a function-by-function basis.

Summary of Invention Paragraph:

[0011] The apparatus of the invention may forestall the measuring of time if it is powered but not actually used. A suitable charging process may be implemented depending on which of different functions with different utility values has been used. Illustratively, the playback function, rewind function, fast forward function, and recording function may each be charged in an appropriately weighted manner when used in practice.

Summary of Invention Paragraph:

[0016] According to a further aspect of the invention, there is provided an electronic apparatus including: an operation inputting element for designating at least an operating state and a non-operating state; a used time measuring element for measuring duration of the operating state as a used time; a cumulative time measuring element for measuring an accumulated used time resulting from the measuring by the used time measuring element; and a chargeable time computing element for computing a chargeable time by weighting the used time measured by the used time measuring element in accordance with a weighting factor reflecting the accumulated used time measured by the cumulative time measuring element.

Summary of Invention Paragraph:

[0017] The electronic apparatus of the above structure permits a charging practice that takes depreciation of the apparatus into consideration. More specifically, charges are weighted in accordance with the used time representative of product depreciation, i.e., the charging rate may be reduced over time. Many products used as fixed assets by corporations are conventionally bought by payment in full. In that case, depreciation expenses necessarily deviate chronologically from the actual spending of money on the product. By contrast, the inventive electronic apparatus allows its depreciation expenses to be spread substantially in time with the actual payment.

Summary of Invention Paragraph:

[0022] The inventive scheme replaces the traditional concept of transferring a product's ownership and lifetime use to a customer for a consideration, with a new concept of charging the user for the exact amount of product usage time. With people's obsession of product ownership discarded, it becomes easier for used products to be recovered and recycled, whereby a truly recycle-oriented society can be realized in time.

Brief Description of Drawings Paragraph:

[0058] FIG. 35 is a graphic representation depicting variations of consideration for product usage time in connection with the ninth embodiment;

Detail Description Paragraph:

[0134] With the second embodiment, the electronic apparatus as the chargeable product is assumed to have a plurality of functions. One such apparatus may be a recording and reproducing apparatus offering such diverse functions as playback, recording, fast forward, rewind, pause, and stop. The used times of the functions are not merely added up to compute a chargeable time; the chargeable time is computed by having the used time of each of the functions multiplied by

a weighting factor established in advance for each function.

Detail Description Paragraph:

[0135] Illustratively, the functions related directly to usage by the user are given larger weighting factors; those functions not directly associated with actual use by the user are provided with smaller weighting factors. A function that cost much when developed may be given a larger weighting factor than less costly functions.

Detail Description Paragraph:

[0136] For example, a playback key (i.e., playback function) of video and/or audio equipment may be considered the reference function having a weighting factor of 1. With respect to that reference function, a stop key (stop function) and a rewind key (rewind function) may be given a weighting factor of 0 each in advance; a fast forward key (fast forward function) may have a weighting factor of 0.5; a recording key (recording function) may be given a weighting factor of 1.2; and an effect key (effect function) may have a weighting factor of 2.

Detail Description Paragraph:

[0137] With the second embodiment, different electronic apparatuses may be given in advance different weighting factors used to compute a chargeable time based on used time. Illustratively, if audio apparatuses are given a weighting factor of 1, then video apparatuses may have a weighting factor of 1.5 to provide for the playback of both video and audio information. Text-oriented apparatuses may be given a weighting factor of 0.8 for their simplified function.

Detail Description Paragraph:

[0138] Varied weighting factors may also be adopted depending on the types of media in use such as CD (compact disc), MD (MiniDisc), DVD (digital video disc), television, and radio.

Detail Description Paragraph:

[0139] Described below in detail is how the second embodiment is implemented through the combination of two weighting schemes: weighting by electronic device type, and weighting on a function-by-function basis. The function-wise weighting is effected in accordance with a load factor P of the CPU in a microcomputer part 31. The load factor P of the CPU is determined by the rate of time in which the CPU operates continuously (including sleep time) for each of the functions involved.

Detail Description Paragraph:

[0187] Although the second embodiment has been shown setting function-wise weighting factors for the chargeable time computation based on the CPU load factor, this is not limitative of the invention. Alternatively, the memory 353 in the charge processing part 35 may be provided with a predetermined function-to-weighting factor correspondence table. From the table in the memory 353, a weighting factor corresponding to any given function may be retrieved and used in the actual computation of chargeable times.

Detail Description Paragraph:

[0273] As with the first embodiment, any one of the second through the seventh embodiments may have its accumulated used time computed for charges based on the time-price relationship table of FIG. 2 for depreciation purposes.

CLAIMS:

2. An apparatus according to claim 1, wherein said chargeable amount computing means computes said chargeable amount based on the execution time regarding each of said functions and through weighting on a function-by-function basis.
3. An apparatus according to claim 2, wherein said function executing means is controlled by a microprocessor, and wherein said chargeable amount computing means computes said chargeable amount based on the execution time regarding each of said functions and through weighting by a load factor of said microprocessor in effect during execution of each of said functions.
4. An apparatus according to claim 2, wherein said chargeable amount computing means computes said chargeable time based on different weighting factors set for different apparatuses.
9. An electronic apparatus comprising: operation inputting means for designating at least an

operating state and a non-operating state; used time measuring means for measuring duration of said operating state as a used time; and chargeable time computing means for computing a chargeable time by weighting said used time measured by said used time measuring means in accordance with different weighting factors set for different electronic apparatuses.

13. An electronic apparatus comprising: operation inputting means for designating at least an operating state and a non-operating state; used time measuring means for measuring duration of said operating state as a used time; cumulative time measuring means for measuring an accumulated used time measured by said used time measuring means; and chargeable time computing means for computing a chargeable time by weighting said used time measured by said used time measuring means in accordance with a weighting factor reflecting said accumulated used time measured by said cumulative time measuring means.

19. A system according to claim 17, wherein said managing apparatus measures an accumulated used time of said electronic apparatus identified by said electronic apparatus identifier and, at the time of settlement regarding said electronic apparatus identified by said electronic apparatus identifier, settles charges in accordance with a charging rate weighted by a weighting factor corresponding to said accumulated used time.

26. A charging method according to claim 25, further comprising the step of computing a chargeable time by weighting the measured used time with regard to each of said functions.

27. A charging method according to claim 26, further comprising the step of computing said chargeable time by weighting said measured used time regarding each of said functions and in accordance with different weighting factors set in advance for different apparatuses.

29. A charging method comprising the steps of: measuring an actual operating time of an apparatus within a chargeable period as a chargeable used time; measuring an accumulated time of said chargeable used time; and computing a chargeable time by weighting the measured accumulated chargeable used time in accordance with a weighting factor corresponding to said accumulated time.

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File: PGPB

Apr 18, 2002

DOCUMENT-IDENTIFIER: US 20020046186 A1

TITLE: ELECTRONIC PURSE SYSTEM HAVING A DOUBLE-STRUCTURED PURSE, IC CARD APPLICABLE TO THE ELECTRONIC PURSE SYSTEM, IC CARD TRANSACTION APPARATUS HAVING A DOUBLE-STRUCTURED PURSE, IC CARD TRANSACTION SYSTEM HAVING A DOUBLE-STRUCTURED PURSE, AND IC CARD APPLICABLE TO THE

Summary of Invention Paragraph:

[0002] In recent years, there has become widespread an IC card with a rewritable and non-volatile memory as well as a microcomputer incorporated therein, and on the other hand, there have been proposed various types of "electronic purse system" in which a transaction with a bank and a purchase of commodities at shops can be performed with an IC card-formed carrier body by transferring some of a deposited amount of a bank account to this IC card between financial institutions.

Summary of Invention Paragraph:

[0004] Especially, in a case of the conventional type of electronic purse system, if any external device accesses one memory area in the IC card, so-called the processing for verification is executed in which a code number of a card holder is verified inside the card and authorized, then identification code of the device is inputted, whether the device is allowed to access the memory area or not is checked, and the access to the area is eventually allowed after all of the processing are finished.

Summary of Invention Paragraph:

[0006] A similar technology to the above technology is disclosed, for instance, in Japanese Patent Laid-Open Publication No. HEI 2-205933. According to this Publication, there is disclosed a system in which an IC card is used for cashless payment when commodity is purchased at vending machines or shops. More specifically, a prepaid area and an area for an off-line account are provided in a memory of the IC card used in the system. The prepaid area is used for storing therein balance for transactions in cash with the balance by using a PIN (Personal Identification Number). The off-line account area is used for storing therein balance as an off-line account for transferring the balance to the prepaid area by using a personal authorization number to increase an amount of the balance in the prepaid area.

Summary of Invention Paragraph:

[0007] Although various types of system linked to an electronic purse system are proposed in the conventional types of IC card system as that in the publication cited above, access to a memory in any of the systems is possible from one electronic purse provided in the IC card only when a code number is successfully verified through specified authorization processing or specified verification processing using a PIN or the like. However, countermeasures for security against a case where an IC card is illegally obtained by an unauthorized person is enhanced by the encryption technology, so that there are some problems as described below in linking the electronic purse system to some other systems.

Summary of Invention Paragraph:

[0012] It is a first object of the present invention to provide an electronic purse system having a double-structured purse in which convenience in use as a prepaid card is improved in a purse with lower security and the security is further improved in a purse with higher security by making use of the characteristics as a double-structured purse for an IC card.

Summary of Invention Paragraph:

[0015] It is a fourth object of the present invention to provide an IC card transaction system having a double-structured purse enabling realization of card transactions in which the convenience in use as a prepaid card is improved in a purse with lower security and the

security is further improved in a purse with higher security by making use of the characteristics as a double-structured purse (IC card).

Summary of Invention Paragraph:

[0017] In order to solve the problems and achieve each of the objects, the electronic purse system having a double-structured purse according to the present invention comprises a portable type of card-formed carrier body comprising a first rewritable and non-volatile memory in turn having a first area in which a first deposited amount is stored and a second area in which a second deposited amount is stored, a processor connected to the memory, a second non-volatile memory with an operation program for the processor stored therein, and an I/O terminal for accessing information stored in the first and second non-volatile memories respectively via the processor, in which at least an individual's authorization number of a card holder in response to the first area of the first non-volatile memory is stored in the first non-volatile memory, identification information indicating types of apparatuses allowing, in response to the second area of the first non-volatile memory, access to the second area is stored in the first non-volatile memory, when accessing the first area, ciphered information received from the I/O terminal is de-ciphered, access is permitted if a code number included in the de-ciphered information and the individual's authorization number stored in the first non-volatile memory satisfy a prespecified relation, and when accessing the second area, access to the second area is permitted if an identification number indicating a type of accessible transaction apparatus coincides with that stored in the first non-volatile memory; a central system having an account file with deposited amounts stored therein; a withdrawing machine directly or indirectly communicating with the central system for transferring all or a portion of a deposited amount in the central system to the first area of the memory in the card-formed carrier body, which ciphers at least either one of identification information for the apparatus and a code number inputted by the card holder and transfers the ciphered information or number to the card-formed carrier body; an input unit for inputting a code number and a amount of money to be transferred from the first area to the second area in the card-formed carrier body; a transfer unit for supplying the code number, amount of money to be transferred, and identification information inputted by the input unit to the card-formed carrier body; and a device in the user's side for transmitting an amount of money used and the apparatus information to use a deposited amount stored in the second area of the card-formed carrier body; and the card-formed carrier body updates the first area, when transfer is instructed by the transfer unit and the individual's authorization number is accepted, by subtracting a specified amount of money from the deposited amount stored in the first area, and also writes the specified amount of money in the second area, and allows, when an amount of money to be used is instructed from the device in the user's side and at the same time access to the second area is permitted according to the identification information, use of the instructed amount of money with the device in the user's side by subtracting the amount of money to be used.

Summary of Invention Paragraph:

[0018] With the electronic purse system having a double-structured purse according to the present invention, in a case of a transaction using the transfer unit, a deposited amount is transferred from the first area (first purse) of the card-formed carrier body to the second area (second purse) through personal authorization with the code number, and in a case of a transaction using the device in the user's side, an amount of money to be used is used in the second area of the card-formed carrier body without requiring the personal authorization, so that characteristics as a double-structured purse are made use of, and for this reason convenience in use as a prepaid card can be improved in a purse with lower security, on the other hand, the security can further be improved in a purse with higher security.

Summary of Invention Paragraph:

[0019] In the electronic purse system having a double-structured purse according to the present invention, a program making the second area allow only the withdrawal processing may be stored in the second non-volatile memory of the card-formed carrier body.

Summary of Invention Paragraph:

[0022] In the electronic purse system having a double-structured purse according to the present invention, the card-formed carrier body skips, when the device in the user's side demands payment without specifying any area in the first non-volatile memory, the processing for de-ciphering the transferred information from the device in the user's side, and allows transaction for subtracting information on the specified amount of money from the second deposited amount.



Summary of Invention Paragraph:

[0024] The IC card applicable to an electronic purse system having a double-structured purse according to the present invention comprises a memory in which a first purse with a first amount of money stored therein, a second purse with a second amount of money stored therein, a payment processing program, and a user's code number program are stored; a processing circuit for executing payment processing according to the payment processing program stored in the memory; a communicating unit for executing communications with external devices; and the payment program executes payment processing according to the second amount of money stored in the second purse when a payment command is received from an external payment demanding device without any purse being specified, and verifies the code and executes the payment processing to the external device according to the amount of money stored in the first purse when a payment command based on specification of the first purse is received.

Summary of Invention Paragraph:

[0026] The IC card applicable to an electronic purse system having a double-structured purse according to the present invention comprises a memory in which a first purse with a first amount of money stored therein, a second purse with a second amount of money stored therein, a payment processing program, and an ciphering/de-ciphering program are stored; a processing circuit for executing payment processing according to the payment processing program stored in the memory; a communicating unit for executing communications with external devices; and an interface unit for managing interface with external transaction devices; and the payment program executes the payment processing according to the second amount of money stored in the second purse when a payment command not based on specification of the first purse is received via the interface unit from an external device, and communicates with the external device using the ciphering and de-ciphering program and executes the payment processing to the external device according to the amount of money stored in the first purse when a payment command based on specification of the first purse is received.

Brief Description of Drawings Paragraph:

[0038] FIGS. 4A and 4B are views each showing an example of the memory configuration of the IC card shown in FIG. 3;

Brief Description of Drawings Paragraph:

[0068] FIG. 34 is a block diagram showing an example of configuration of the ATM as one example of the withdrawing machine in Embodiment of the present invention;

Brief Description of Drawings Paragraph:

[0069] FIG. 35 is a flow chart for explaining operations for a transaction between the ATM shown in FIG. 34 and the IC card;

Brief Description of Drawings Paragraph:

[0070] FIG. 36 is a flow chart for explaining operations for a transaction between the ATM shown in FIG. 34 and the IC card;

Brief Description of Drawings Paragraph:

[0071] FIG. 37 is a flow chart for explaining operations for a transaction between the ATM shown in FIG. 34 and the IC card;

Brief Description of Drawings Paragraph:

[0072] FIGS. 38A to 38E are views each showing one example of a display screen during the operations for a transaction by the ATM in Embodiment of the present invention; and

Brief Description of Drawings Paragraph:

[0073] FIGS. 39A to 39D are views each showing one example of a display screen during the operations for a transaction by the ATM in Embodiment of the present invention.

Detail Description Paragraph:

[0083] The EEPROM 106 is a non-volatile memory and has a first purse area 106A and a second purse area 106B used for realizing each function of the first purse 1A and second purse 1B each described above, and a third purse area 106C used for recording historical information of transactions with service terminals.

Detail Description Paragraph:

[0084] Next description is made for the construction of a double-structured purse of the IC

card. FIGS. 4A and 4B are views each showing an example of memory configuration of the IC card 1 shown in FIG. 3. The double-structured purse of the IC card 1 is formed with the first purse area 106A and the second purse area 106B. More specifically, the EEPROM 106 of the IC card 1 is divided into a directory area shown in FIG. 4A and an information area shown in FIG. 4B.

Detail Description Paragraph:

[0095] Next detailed description is made for the device in the user's side 4 shown in FIG. 1. FIG. 7 is a block diagram functionally showing the device in the user's side 4 shown in FIG. 1. The device in the user's side 4 shown in FIG. 7 comprises a machine ID register 41, a transfer processing section 42, a payment amount generating section 43, a transaction processing section 44, a receiving section 45, and a memory 46.

Detail Description Paragraph:

[0097] The transaction processing section 44 executes the processing for transaction according to the amount of money to be paid requested for service provision in response to the demand from the IC card 1. The receiving section 45 receives an amount of money for payment required for the service according to insertion of the IC card 1 therein, sends a report on the reception to the transaction processing section 44, and sends historical information on the services to the memory 46. The memory 46 receives the historical information on the IC card 1 from the receiving section 45 and stores the received history therein.

Detail Description Paragraph:

[0155] The ordinary transaction machine shown in FIG. 21 comprises an IC card reader/writer 401, a display 402, a ten-key 403, equipment 404 such as a bar code reader, a receipt printer 405, a CPU 406, a memory 407, and a card processor 408 for a shop. It should be noted that it is assumed that the processing itself such as discharging of pachinko balls or exchanging from balls to cash is executed by some other device (not shown in the figure) connected to the ordinary transaction machine.

Detail Description Paragraph:

[0156] The IC card reader/writer 401 reads information stored in the IC card 1 or writes information therein, when an IC card is inserted therein. The display 402 visually displays thereon information in a transaction. The ten-key 403 comprises numerical keys for entry numerals such as an amount of money to be paid. The equipment 404 such as a bar code reader reads bar code information from a sheet with the bar code recorded thereon. The receipt printer 405 records a result of services such as change to balls or change to cash or the like. The CPU 406 provides controls for processing of the ordinary transaction machine on the whole. The memory 407 comprises a ROM for storing therein a program with which the CPU operates and a RAM used as a work area of the CPU 406. The card processor 408 for a shop is equipment for processing a card specific to the shop.

Detail Description Paragraph:

[0158] The ordinary transaction telephone unit shown in FIG. 22 comprises an IC card reader/writer 501, a display 502, equipment 503 for controlling services for the telephone unit or the like/message units, a receipt printer 504, a CPU 505, a memory 506, and a card processor 507 for a shop.

Detail Description Paragraph:

[0159] The IC card reader/writer 501 reads information stored in the IC card 1 or writes information therein, when an IC card is inserted therein. The display 502 visually displays thereon information in a transaction. The equipment 503 for controlling services for the telephone unit or the like/message units is connected to a telephone line not shown in the figure and provides controls for message units for accounting according to a period of time and a call distance or the like when a telephone function is used. The receipt printer 504 records a result of telephone services or the like. The CPU 505 provides controls for processing of the ordinary transaction telephone unit on the whole. The memory 506 comprises a ROM for storing therein a program with which the CPU 505 operates and a RAM used as a work area of the CPU 505. The card processor 507 for a shop is equipment for processing a card specific to the shop.

Detail Description Paragraph:

[0162] When the ordinary transaction machine finishes the preprocessing, the machine ID of the machine is read out (step T102). At this point of time, a display screen requesting entry of a demanded amount for payment is formed on the display 402 of the ordinary transaction machine. In this step, entry of the demanded amount for payment becomes possible, and if the demanded

amount for payment is entered thereafter, the amount to be paid is temporarily stored in the memory 407. Then, after a machine ID is sent together with a payment command to the IC card 1 (step T103), the ordinary transaction machine waits for receiving an amount of money in the second purse sent from the IC card 1 (step T104).

Detail Description Paragraph:

[0165] The ordinary transaction machine displays, when having received the balance of the second purse from the IC card 1 (step T105), the received amount on the display 402 (step T106). Then, if a demanded amount for payment has been entered at this stage by operations of the ten-key 403 (step T107), the processing shifts to step T111. In step T111, the demanded amount for payment stored in the memory 407 is read out and sent to the IC card 1. Then the processing shifts to step T112.

Detail Description Paragraph:

[0175] When the ordinary transaction telephone unit finishes the preprocessing, a machine ID of its own is read out (step T202). At this point of time, a display screen requesting entry of a demanded amount for payment is formed on the display 402 of the ordinary transaction telephone unit. In this step, entry of the demanded amount for payment becomes possible, and if the demanded amount for payment is entered thereafter, the amount to be paid is temporarily stored in the memory 506. Then, after a machine ID is sent together with a payment command to the IC card 1 (step T203), the ordinary transaction telephone unit waits for receiving an amount of money in the second purse sent from the IC card 1 (step T204).

Detail Description Paragraph:

[0209] Next description is made for the withdrawing machine 2 with an application thereof. FIG. 34 is a block diagram showing an example of configuration of an ATM (Automatic Teller Machine) as one example of the withdrawing machine in Embodiment.

Detail Description Paragraph:

[0210] The ATM shown in FIG. 34 comprises a CRT/touch panel 601, a display control section 602, an entry detecting section 603, an IC card reader/writer 604, an interface 605, a cash counter/deposit mechanism 606, a mechanism control section 607, a line control section 608, an ciphering/de-ciphering board 609, a CPU 610, a memory 611, an external memory 612, a bank IC card reader 613.

Detail Description Paragraph:

[0211] The CRT/touch panel 601 is used for entering information and various operations by touching the display screen. The display control section 602 provides controls for a CRT display of the CRT/touch panel 601, and the entry detecting section 603 detects a touch-entry through the CRT/touch panel 601. The IC card reader/writer 604 has an IC card 1 inserted therein, and reads information from and writes information in the IC card 1. The interface 605 manages interface between an IC card 1 and the inside of the ATM.

Detail Description Paragraph:

[0213] The CPU 610 provides controls over the machine on the whole. The memory 611 comprises a ROM for storing therein a program with which the CPU 610 operates and a RAM used as a work area of the CPU 610. The external memory 612 is a high-capacity memory such as a hard disk. The bank IC card reader 613 has an ordinary bank card inserted therein for operating a sequence for on-line banking and reads information on authorization from the card.

Detail Description Paragraph:

[0214] Next description is made for operations of the ATM. FIG. 35 to FIG. 37 are flow charts each for explaining operations for a transaction between the ATM shown in FIG. 34 and an IC card, and FIGS. 38A to 38E and FIGS. 39A to 39D are views each showing one example of a display screen during the operations for a transaction by the ATM in Embodiment.

Detail Description Paragraph:

[0215] At first, the ATM provides, to transact for withdrawal with an IC card 1, as shown in FIG. 38A, an initial screen with an instruction of inserting a card therein, an entry of a code number and an entry of a mode provided on the CRT/touch panel 601 (step T401). After this initial screen is provided thereon, the ATM starts preprocessing (step T402). In accordance with it the IC card 1 also executes preprocessing (step C401).

Detail Description Paragraph:

[0216] Then, the ATM displays a second screen by deleting the instruction of card insertion or the like (step T403). Then, when one of modes (Payment, Deposit (card deposit), Transfer, Balance for reference) is specified through a touch operation onto the CRT/touch panel 601 (step T404), determination is made which mode the specified mode is (step T405). Herein the mode assumes a payment mode. Accordingly, if any mode other than the payment mode is specified, the figure and description thereof are omitted as processing for some other mode.

Detail Description Paragraph:

[0220] When the "Account/Card" mode is specified, a screen for entering an amount of money as shown in FIG. 39A appears on the CRT/touch panel 601, and an operation to the screen for entering an amount of money and editing of the screen are executed (step T409). There appear on the screen for entering an amount of money shown in FIG. 39A an instruction to enter an amount of money to be withdrawn from A1 (one side as an example) to A2 (the other side as an example), numeric keys for entering an amount of money, keys for entering a unit of an amount of money (e.g. "Man-Yen" indicating ten thousand yen, and "Sen-Yen" indicating one thousand yen), an Enter key pressed after the amount of money is entered, and a Cancel key for canceling this mode. Any of displays can be realized with touch-entry.

Detail Description Paragraph:

[0222] The ATM sends, after an amount of money is specified and a code number is entered (step T411 and step T412), an update command including the code number, a demanded amount for payment (a specified amount of money), a machine ID, and an area ID (the first purse is specified herein) to the IC card (step T413). It should be noted that the reason why the update command is used herein is because balances in A1 and A2 are updated in accordance with transfer of an amount of money from A1 to A2. It should be noted that this update command identifies the mode specified in step T405.

Detail Description Paragraph:

[0223] The IC card 1 reads, when having received a payment command from the ATM (step C402) and as an area ID is included in the received update command (step C403), an area indicated by the area ID (step C404).

Detail Description Paragraph:

[0226] When the processing shifts to step C408 in the IC card 1, determination is made as to whether the area ID specifies the third purse, namely information on the center account or not. According to the above operational flow, the area ID is the first purse, so that, in this case also, this transaction is regarded as invalid and the processing is terminated. If it is determined that the third purse is specified, the processing further shifts to step C409 and authenticates an access right to information on the center account. Then, if the ATM is a readable machine (step C409), an account number is read out in step C410, and the account number is outputted to the ATM (step C411). After the operations, this transaction is ended.

Detail Description Paragraph:

[0229] Further, verification is made between the de-ciphered code number of the IC card itself and the de-ciphered code number received from the ATM (step C415), and if both of the code numbers coincide with each other (step C416), the authorization is regarded as successful and the processing shifts to step C417. On the other hand, when the authorization is not successful, this transaction for payment is regarded as invalid and invalidated.

Detail Description Paragraph:

[0230] Further, the IC card 1 ciphers each balance in the first purse area 106A as well as the second purse area 106B and sends the ciphered balances to the ATM (step C417).

Detail Description Paragraph:

[0231] The ATM waits for, after the ciphered information is sent in step T413, receiving the balances (ciphered information) in the first purse and the second purse from the IC card 1 (step T414). If the time for waiting is over the preset period of time, the processing shifts to the step for returning a card and is forcefully terminated.

Detail Description Paragraph:

[0232] The ATM sends, when having received the balances (ciphered information) in the first purse and the second purse from the IC card 1 within the preset period of time (step T414), at first, the code number, information on an account, and the amount to be withdrawn to the central system 3 (step T416). It should be noted that information on an account can be obtained

by making the IC card 1 execute the step C 408 to step C411. Then, the received balances are displayed, as shown in FIG. 39B, on the CRT/touch panel 601 (step T417). Then, the ATM waits for a report on IC card's being payable from the central system 3 (step T419).

Detail Description Paragraph:

[0233] The IC card 1 de-ciphers, after the ciphered information is sent in step C417, the demanded amount for payment having been received (step C418). Then, the de-ciphered amount for payment is added to the balance stored in the first purse area 106A, and the total amount is stored in the work area W2 (step C419). Then, the system waits for receiving validation code from the ATM (step C420).

Detail Description Paragraph:

[0234] The ATM sends, when having received the report on IC card's being payable from the central system 3 (step T418), the validation code to the IC card 1 (step T420) according to the operation for checking by the user (step T419). Then, when having received transaction-completion signature code from the IC card 1, the ATM executes the processing for preparing historical information on that transaction and the processing in the ATM side is ended.

Detail Description Paragraph:

[0235] In the IC card 1, when the validation code is received from the ATM (step C420), the transaction for payment is regarded as valid, and the ciphered amount of money stored in the work area W2 is stored in the first purse area 106A (step C421). As described above, the balance in the first purse area 106A is updated according to the amount of money to be paid from the account to the IC card.

Detail Description Paragraph:

[0236] Further, stored in the third purse area 106C is information on the date of the transaction for transfer as historical information (step C422). Finally, transaction-completion signature code is sent to the ATM to report that the processing inside the IC card 1 is completed to the ATM (step C423).

Detail Description Paragraph:

[0239] As described above, with this embodiment, the characteristics as a double-structured purse (IC card) are made use of, and for this reason it is possible to improve the convenience in use as a prepaid card in the second purse with lower security and to further improve the security in the first purse with higher security.

Detail Description Paragraph:

[0246] As described above, with the electronic purse system having a double-structured purse according to the present invention, the characteristics as a double-structured purse are made use of, and for this reason it is possible to obtain an electronic purse system having a double-structured purse in which the convenience in use as a prepaid card can be improved in a purse with lower security, on the other hand, the security can further be improved in a purse with higher security.

Detail Description Paragraph:

[0247] In the electronic purse system having a double-structured purse according to the present invention, a program making the second area allow only the withdrawal processing may be stored in the second non-volatile memory of the card-formed carrier body.

CLAIMS:

1. An electronic purse system having a double-structured purse comprising: a portable type of card-formed carrier body comprising a first rewritable and non-volatile memory in turn having a first area in which a first deposited amount is stored and a second area in which a second deposited amount is stored, and an I/O terminal for accessing information stored in said first and second non-volatile memories respectively; when accessing said first area, ciphered information received from said I/O terminal is de-ciphered, access is permitted if a code number included in the de-ciphered information satisfies a prespecified relation, and when accessing said second area, access to said second area is permitted if an identification number indicating a type of accessible transaction apparatus; a withdrawing machine for transferring all or a portion of a deposited amount to the first area of the memory in said card-formed carrier body, which ciphers at least either one of identification information for the apparatus and a code number inputted by the card holder and transfers the ciphered information or number

to said card-formed carrier body; an input unit for inputting a code number and a amount of money to be transferred from said first area to said second area in said card-formed carrier body; a transfer unit for supplying the code number, amount of money to be transferred, and identification information inputted by said input unit to said card-formed carrier body; and a device in the user's side for transmitting an amount of money used and the apparatus information to use a deposited amount stored in the second area of said card-formed carrier body; wherein said card-formed carrier body updates said first area, when transfer is instructed by said transfer unit and said individual's authorization number is accepted, by subtracting a specified amount of money from the deposited amount stored in said first area, and also writes the specified amount of money in said second area, and allows, when an amount of money to be used is instructed from said device in the user's side and at the same time access to said second area is permitted according to said identification information, use of the instructed amount of money with said device in the user's side by subtracting said amount of money to be used.

2. An electronic purse system having a double-structured purse according to claim 1; wherein said card-formed carrier body has a program making said second area allow only the withdrawal processing stored in said second non-volatile memory.

3. An electronic purse system having a double-structured purse according to claim 1; wherein said card-formed carrier body has further a third area in said first non-volatile memory with identification information for a device in the user's side and a code number each allowing access to said third area registered in said third area, and a program for allowing addition or subtraction in said third area when identification information and a code number corresponding to information registered from said device in the user's side are inputted is stored in said second non-volatile memory.

5. An electronic purse system having a double-structured purse according to claim 2; wherein said card-formed carrier body skips, when said device in the user's side demands payment without specifying any area in said first non-volatile memory, the processing for de-ciphering the transferred information from said device in the user's side, and allows transaction for subtracting information on the specified amount of money from said second deposited amount.

6. An IC card applicable to an electronic purse system having a double-structured purse comprising: a memory in which a first purse with a first amount of money stored therein, a second purse with a second amount of money stored therein, a payment processing program and cipher program are stored; processor for executing said payment processing program and cipher program; communicating means for executing communications with external devices; wherein according to said payment processing program, said processor takes a steps of; distinguishing said external device communicating between first type of transaction using only said second purse being allowed and second type of transaction using both of said first and said second purse being allowed; executing payment processing program with ciphering at least a part of communication data for said external device being allowed to proceed said second type of transaction during the payment transaction; and executing payment processing program without ciphering communication data for said external device being allowed to proceed said first type of the transaction.

7. An IC card applicable to an electronic purse system having double-structured purse according to claim 6, further comprising: said memory storing key information in a read protection area protected to read from said external device for said cipher program which is commonly embodied in the authorized external devices for the electric money transaction; and said cipher program ciphering the transaction data using said key information stored said memory.

8. An IC card applicable to an electronic purse system having a double-structured purse comprising: a memory in which a first purse with a first amount of money stored therein, a second purse with a second amount of money stored therein, and a payment processing program are stored; a processor for executing payment processing according to the payment processing program stored in said memory; a communicating unit for executing communications with external devices; wherein said payment program executes payment processing according to the second amount of money stored in said second purse when a payment command is received from an external payment demanding device without any purse being specified, and executes the payment processing to said external device according to the amount of money stored in said first purse when a payment command based on specification of said first purse is received.

9. An IC card applicable to an electronic purse system having a double-structured purse comprising: a memory in which a first purse with a first amount of money stored therein, a second purse with a second amount of money stored therein, a payment processing program, and an ciphering/de-ciphering program are stored; a processor for executing payment processing according to the payment processing program stored in said memory; a communicating unit for executing communications with external devices; and an interface for managing interface with external transaction devices; wherein said payment program executes the payment processing according to the second amount of money stored in said second purse when a payment command not based on specification of the first purse is received via said interface from an external device, and communicates with the external device using said ciphering and de-ciphering program and executes the payment processing to said external device according to the amount of money stored in said first purse when a payment command based on specification of said first purse is received.

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L6: Entry 18 of 579

File: PGPB

Apr 1, 2004

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TITLE: Parallel process execution method and multiprocessor computer

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## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Shibayama, Satoki	Kawasaki		JP
Matsushima, Yusuke	Kawasaki		JP
Kikushima, Kaoru	Kawasaki		JP

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	COUNTRY	TYPE CODE
Fujitsu Limited				03

APPL-NO: 10/648181 [PALM]

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REPRESENTATIVE-FIGURES: 1

## ABSTRACT:

A parallel process execution method that allocates CPU time to parallel processes at any desired ratios. The method sets a time allocation ratio to determine how much of a given cycle period should be allocated for execution of a parallel program. Process switching is then performed in accordance with the time allocation ratio set to the parallel program. More specifically, parallel processes produced from a parallel program are each assigned to a plurality of processors, and those parallel processes are started simultaneously on the processors. When the time elapsed since the start of the parallel processes has reached a point that corresponds to the time allocation ratio that has been set to the parallel program, the execution of the assigned parallel processes is stopped simultaneously on the plurality of processors.

[0001] This Application is a continuing application, file dunder 35 U.S.C. .sctn. 111(a), of International Application PCT/JP01/01532, filed on Feb. 28, 2001.

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L6: Entry 18 of 579

File: PGPB

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DOCUMENT-IDENTIFIER: US 20040064817 A1

TITLE: Parallel process execution method and multiprocessor computer

Summary of Invention Paragraph:

[0009] To address the above issue, a process scheduling method is disclosed in the Unexamined Japanese Patent Publication No. 10-74150 (1998), in which a time-sharing computer system is configured to cause all constituent CPUs to start and stop parallel processes and other processes simultaneously at predetermined unit intervals (called "phase"). That is, the CPUs execute a plurality of parallel processes produced from a certain parallel program, starting and stopping them all at the same time. While synchronization wait times may arise in the course of parallel processes, the disclosed method keeps their time length equal to that in the case without time sharing. As a result, it minimizes the amount of waiting time for synchronization between parallel processes constituting a parallel program, thus preventing the system's efficiency from decreasing.

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## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Walpert, Gary A.	Weston	MA	US

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REPRESENTATIVE-FIGURES: 3A

## ABSTRACT:

A cooperative computer system interconnects the plurality of computers through a network. Each computer is able to execute a foreign computer program received from another computer on the network whenever the local computer has capacity to execute the received program based upon local computer operating requirements. The local computer returns to the foreign computer required information regarding execution of the foreign computer program. The execution of the foreign computer program at the local computer is enabled only when the effect on a local user is minimal. Once the foreign program is operating, it can be interrupted if the effect of its execution as perceived by the local user becomes other than minimal, and sufficient data and context information for continuing execution of an interrupted foreign program can be returned to the foreign computer for transmittal and completion of the interrupted program on a computer other than the local computer.

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File: PGPB

Jun 17, 2004

DOCUMENT-IDENTIFIER: US 20040117433 A1

TITLE: Cooperative computer network

Detail Description Paragraph:

[0027] In some computer systems, multitasking will be available. Under multitasking, the computer can execute more than one computer program at a time, each program time sharing the computer CPU. In the event multitasking is available, in accordance with the preferred embodiment of the invention, priority is given to the user program so that the response time which the user experiences, even when there is a foreign program being executed by the machine, is not noticeably worse than that which is experienced when the user's programs is operating by itself. Accordingly, in a multitasking system, instead of needing to interrupt the foreign executing program when a local interrupt is received, the computer system, in the preferred embodiment, merely changes its priorities so that the local user is effectively unaware that the foreign program is executing.

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TITLE: Information processing system, information processing device, distributed information processing method and computer program

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## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Oka, Masaaki	Kanagawa		JP

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	COUNTRY	TYPE	CODE
Sony Computer Entertainment Inc.	Tokyo		JP	03	

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REPRESENTATIVE-FIGURES: 3

## ABSTRACT:

The objective is to facilitate leasing of excess computing resources of a processor when computing resources of other processors are deficient, thereby making distributed computing more efficient.

A computing resource of a processor is clustered into sub processors, and the operating status of each of the sub processors is monitored by a management processor, so that a task is assigned to a sub processor that is operated according to the magnitude of the load of information processing requested. When a request for resource leasing is made from another computer via I/O interface, a computing resource of a idle sub processor is leased.

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DOCUMENT-IDENTIFIER: US 20040205759 A1

TITLE: Information processing system, information processing device, distributed information processing method and computer program

Summary of Invention Paragraph:

[0005] Generally, when tasks are executed by a single computing resource within a computer, time sharing process or the like is employed to assign tasks. The degree with which the computing resources are left is determined by how much time is used to complete the task as the task is partitioned by a certain time unit. FIG. 12(a) illustrates this situation.

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